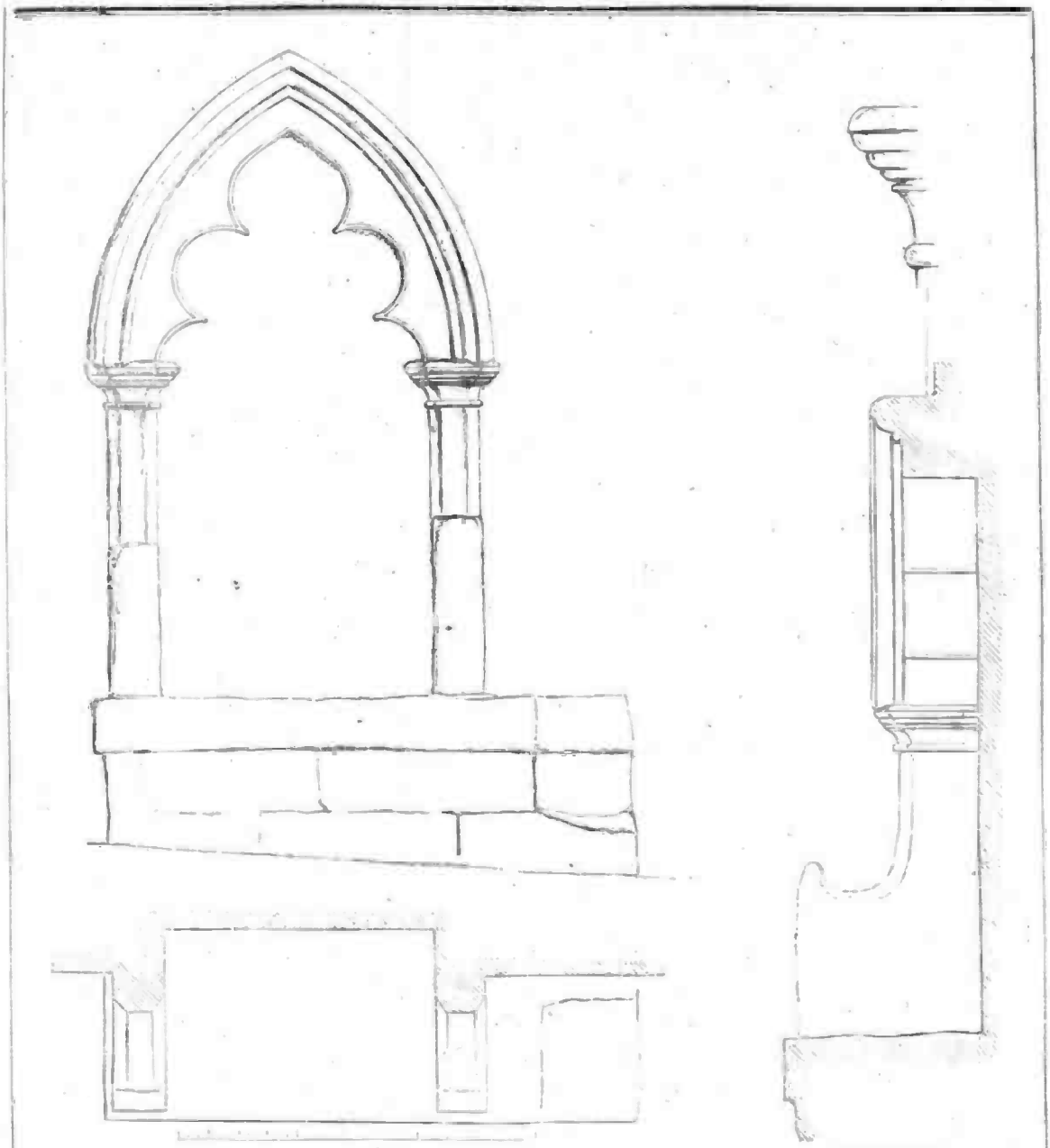

ELEVATION. SECTION.

ON THE EXCAVATIONS OF THE ROCKY CHANNELS OF RIVERS BY THE RECESSION OF THEIR CATARACTS.

DURING the late meeting of the British Association at York, Mr. Featherstonhaugh drew attention to the manner in which extensive swampy districts upon the continent of North America have been drained and rendered fit habitations for man. During his researches in that part of the western hemisphere, he found evidences upon all the rivers whose valleys were bounded by lofty escarpments, that the gorge in which each river flowed had been cut out of the land by the recession of a cataract. The river Mississippi flowed in a valley of this character. From the Falls of St. Anthony to its mouth in the Gulf of Mexico, the distance was about 2,000 miles, during the first 1,200 of which these escarpments, varying from 100 to 450 feet in height, were everywhere found, divided from each other by a width varying from one to two and a half miles, the valley being during the greater part of this course thickly studded with well-wooded islands, amongst which the waters of the river flowed. Upon a level with the surface of these islands were extensive plains connected occasionally with lateral valleys coming through the escarpments, the soil of which was identically the same with that of the islands, being a light vegetable sandy soil much mixed up with decayed fresh-water shells; shewing that these soils were the old muddy bottom of the river, deposited when it occupied the whole breadth of the valley from escarpment to escarpment. These, and analogous appearances upon the courses of other American rivers, especially the immense lacustrine deposits separating Lake Erie from Lake Huron, seventy miles in breadth, were adduced as proofs of a great diminution of the quantity of fresh water once occupying the lakes, and the fluviatile courses of that continent: indeed, from the difference of level between a point on the Wisconsin River and the channel of upper Fox River, over which boats now pass in time of great floods, the water communication betwixt the Mississippi and Lake Erie seems to have been uninterrupted. This portion of the paper was intended to shew that the quantity of water in the rivers in ancient times so far exceed the quantity flowing in them at present, that the cataracts in the rivers must have been much more powerful, and that therefore the process of excavation of the rocky channels of rivers by the recession of their cataracts, must have been then effected in much shorter periods of time than at present. From all these considerations, and from the known fact that the Falls of St. Anthony had not receded more than twenty yards in the last 100 years, the author drew the deduction that the whole valley of the Mississippi, from the Falls of St. Anthony to the point where the escarpments terminate, had been excavated by the recession of that cataract, and that the excavation had proceeded at a much more rapid pace than it does in our times. The author next proceeded to explain the peculiar mechanical power which streams employ in forming their channels by the operation of cataracts, and divided it into two methods, the *molar* or grinding process, most common in mountainous countries constituted of primary rocks, and the *subtracting* or undermining power exercised upon strata of a softer quality. To illustrate the first of these methods, Mr. Featherstonhaugh exhibited a beautiful pictorial view of a remarkable cataract in the Cherokee country, called Ovnay Kay Amah, or White Water, which he visited in 1837, and which had not attracted the attention of any other traveller. This cataract was at a point

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